



Joseph's Coat
Moth
(*Agarista agricola*)

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PLANNING AND ORGANIZATION MEETINGS

A quarterly meeting is scheduled in order to plan club activities and the magazine.
See BOIC Programme.

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Membership fees are \$25 for individuals, schools and organizations

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AIMS OF ORGANIZATION

- To establish a network of people growing butterfly host plants;
- To hold information meetings about invertebrates;
- To organize excursions around the theme of invertebrates e.g. butterflies, native bees, ants, dragonflies, beetles, freshwater habitats, and others;
- To promote the conservation of the invertebrate habitat;
- To promote the keeping of invertebrates as alternative pets;
- To promote research into invertebrates;
- To encourage the construction of invertebrate friendly habitats in urban areas.

MAGAZINE DEADLINES

If you want to submit an item for publication the following deadlines apply:

March issue	February 14 th	June issue	May 14 th
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September issue – August 14th December issue – November 14th

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COVER

Joseph's Coat Moth (*Agarista agricola*) - Painting by Lois Hughes. Prints of this painting are available from the artist. Ph. 07 3206 6229



FROM THE PRESIDENT

Many members will recall that last September the BOIC had a brochure exchange with “The Australian Entomologist” through inserts in our respective publications. As a result of this exchange a good number of BOIC members have subscribed to this high quality quarterly and we have welcomed several new members into the BOIC.

As each new edition of “Metamorphosis Australia” comes closer to printing, I am always impressed by the quality and interest of the articles to be included. I am further impressed by and appreciative of the very considerable time and effort taken by the authors to make observations, accumulate data and images, write drafts, consult others and revise those drafts. While thanking all contributors for their “work,” I would especially like to thank Rob Whyte, Bill Graham and Glen Cleminson for their first contributions to our Magazine.

Daphne Bowden volunteers a great deal of her time and talents to edit the Magazine each quarter. This edition has proved no exception requiring lots of contact with the various authors and our expert consultants, detailed proof reading of articles, planning layout and assembling text, images and captions into the final product. This is then followed by examination of a test print run and “tweaking” where necessary. Next there is the processing and distribution of the magazine to members. Thank you again Daphne.

Best wishes **Ross**

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Joseph's Coat Moth (*Agarista agricola*) - Lois Hughes

Anyone familiar with the Biblical account concerning Joseph will recall his coat of many colours, given by Jacob, his father, as a sign of favour and an indication of his potential to become significant, which did eventuate.

This common name given to the day-flying moth is an appropriate one as even the caterpillars are strikingly patterned with encircling bands of alternating black, white and orange. A portent, perhaps, of the brightly coloured and strikingly patterned moths they will become. Could these bright caterpillar colours also act as a warning to predators that they may be distasteful, but in this case is probably only a bluff? Another interesting feature of the larvae is the multiple paddle shaped setae (spines) that protrude from their bodies.

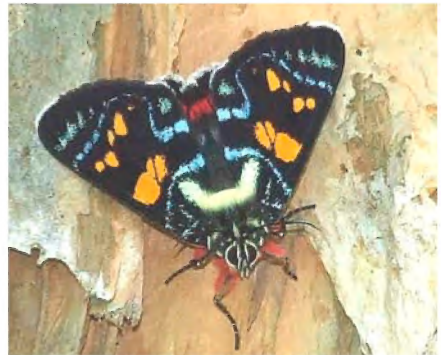
The female is usually the larger of the two, with a wingspan between 65 and 70 mm and the male being between 55 to 65 mm. The male and female are similarly coloured but differ slightly, but significantly, in pattern and this is very apparent when viewed from above.



Agarista agricola larva – Photo Ross Kendall



A. agricola female - taken, with permission, from Australian Moths Online
<http://www.ento.csiro.au/anic/moths.html>



A. agricola males – seen on right in a typical position with head down
Photos (left) John Hughes (right) Russel Denton



The female has extensive cream markings extending from the dorsum of the thorax to cover the whole of the base of the upper-side forewings. The male, however, has these markings reduced, interestingly, to the shape of the letter “M” when viewed, resting, with its head up. Naturally this becomes a “W” when it is seen perched, as it most often does, head down.

They are sometimes mistaken for butterflies when on the wing, but once they settle, with wings flat, it is obvious they are moths. Very strong flyers, the male is sometimes seen patrolling in the vicinity of an area where the host plants grow, often returning to the same lookout post as he waits for a receptive female to appear.

Their host plants, vines, are *Cissus opaca* (illustrated), *Cayratia clematidea* and grape vines (*Vitis vinifera*). I have observed moths feeding at Lantana flowers. The moth’s hairy red legs are a distinguishing feature and quite comical, reminiscent of fluffy p.j. pants!



Final instar *A. agricola* larva – Photo Russel Denton

They are fascinating to raise in captivity. At maturity, the caterpillar’s white bands turn orange and they begin wandering in search of a suitable pupation site, becoming quite agitated. They have powerful mandibles, one even chewing a hole in the old metal fly-screen mesh top of the coolite box in which they were raised. At this stage they can travel long distances away from their host plant. In captivity they will burrow into the coolite box, crawl into the

tunnel created and cover the entrance with their chewings, pupating inside.

Generally, in the wild, they take advantage of a curled piece of bark and close each end with finely masticated pieces of bark. This habit seems to be common amongst many of the related agaristine moths (see Ross Kendall’s article on *Cruria donowani*, pages 9 to 12 in Metamorphosis Australia magazine no. 52).

The original cover painting of the moths was commissioned by Frank Jordan and Helen Schwencke for the back cover of their book “Create More Butterflies” and is available from me as a print (31cm x 21.6 cm).

I thank John Moss for his helpful comments in the preparation of this article.



Native Grapes – Peter Hendry

Australia has several native grapes in the plant family Vitaceae. Though not known for their taste some are used as bush foods and can be used to make grape jelly. Two species are known to be hosts for our creature feature *Agarista agricola*.

Cissus opaca

Cissus (SISS-us) from the Greek kissos, ivy; in allusion to its climbing habit
Opaca meaning, in the shade; shaded

C.opaca is a slender vine reaching around six meters in length. It forms a tuba underground. The compound leaf is digital in shape, having five leaflets - sometimes three or four. The margins of the leaves are entire or serrate and a paler green below. The flowers are small yellowish-green and form in a compact inflorescence. The rounded fruit is purplish in colour to a diameter of 15mm.

C.opaca can be grown from seed or cuttings of older growth. It requires good drainage and part shade, is moderately frost tolerant and will tolerate dry periods when established.

N.B. In the latest Queensland Herbarium plant census *Cissus opaca* has been referred to the new genus *Clematocissus*

Cayratia clematidea

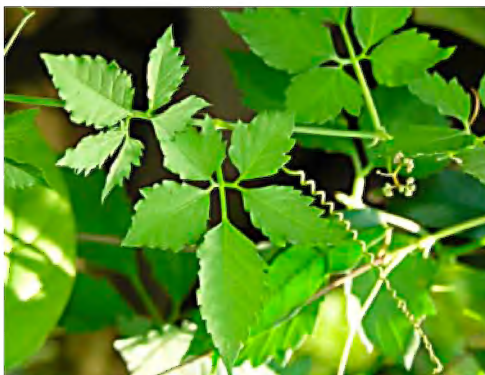
Cayratia (cay-RAY-sha) from an Indian name

Clematidea, from clematis- a climbing vine

C. clematidea is a slender vine with underground stems that form small tubers. The compound leaves have soft hairs, the five leaflets having serrated margins. A flower or tendril opposes each leaf. The small greenish-white flowers with four petals are arranged in a cluster on a long stalk (peduncle), about equal to the length of the leaves. The fruit is a berry about 6 mm in diameter. *C. clematidea* dies back in autumn and is capable of regenerating itself in spring from its underground tubers.



Cissus opaca



Cayratia clematidea



C. clematidea can be grown from seed or cuttings of older growth and is probably best grown in part shade.

Both *Cissus opaca* and *Cayratia clematidea* are hosts for several species of hawk moths and also host leaf eating beetles.

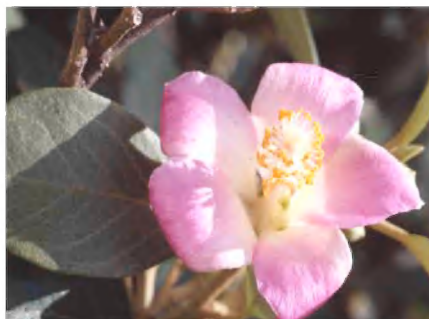
Photos – Peter Hendry

ITEMS OF INTEREST

Broody Bugs and Itchy Cows – Densey Clyne

The Norfolk Island Hibiscus tree (*Lagunaria patersonii*), planted in my garden 6 years ago, is now well grown. It regularly bears pretty pink flowers, followed by rough-textured seed capsules. I didn't plant it for the flowers though; it was meant to attract one of my favourite insects and I had long given up hope of this happening.

L. patersonii is commonly planted in seaside parks because it is a good-looking tree that doesn't mind salt spray, but its seed capsules contain irritant hairs that have given it the common name 'cow-itch tree'. Presumably the Norfolk Island cows that rub against them get itchy backsides!



Flower of Norfolk Island Hibiscus tree



Female Harlequin Bug feeding at seed capsule of *Lagunaria patersonii*

I don't really believe it though - don't cows rub against trees in order to *relieve* an itch? Just the same, it's best to avoid contact with those prickly seeds - cows have tougher hides than humans.

It was on one of those seaside trees that I'd first photographed the gorgeously colourful Harlequin Bugs, so I assumed that simply planting a tree would bring them to my garden. But years passed and no bugs came. Was my present garden on the Mid North Coast of NSW too far from the sea? Anyhow I simply gave up looking for them.

But now success at last! On a walk around the garden one day recently, I spotted a tiny patch of bright orange high up in the foliage - a



female *Tectocoris diophthalmus* with her haustellum or ‘drinking straw’ sunk into one of the seed capsules. My bugs have arrived!



Encounter between brooding female and intrusive male



Female protecting her eggs

Cricking my neck - the tree is a big one - I scanned the branches and yes, another female, this one astride a batch of eggs. As with many ‘true’ bugs, the female Harlequins sit on their eggs like broody hens, warning off predators - and the occasional pushy male - with quick body jerks.

Then, low down in the foliage, I spied a tight cluster of brilliantly coloured little buglets, their small sucking tubes pushed through the rigid covering of a seed capsule. On further inspection I found individual young ones drinking from stems and leaves, some showing the female colouring, others obviously male. So my long wait has not been in vain, though it’s possible the bugs might have found my garden two or three years earlier.



Harlequin Bugs hatching from eggs

As the images show these are among the most colourful and easy to photograph Australian insects. Females range in colour from bright orange to pale yellow with varied green or blue markings. The males are very splendid with metallic green, blue and red colour patterns. Eggs are pink and new hatchlings a glowing tangerine. As



these insects have no obvious weapon of defence, their vivid colours probably warn predators that they're distasteful or poisonous.

Harlequin bugs are members of the Jewel Bug family Scutelleridae. They belong in the insect Order Hemiptera, called 'true bugs' to differentiate them from the blanket name 'bug' so often used, especially in North America, for any insect. Sometimes known as Cotton Harlequins, these insects are known to attack other plants of the Malvaceae family, including commercial cotton crops. I have never found them on my exotic hibiscus shrubs or any other garden plant.



A female with juvenile males



Harlequin Bugs mating

Harlequin bugs can light up a tree like miniature Christmas decorations, but in my experience there are never enough to harm a full-grown Norfolk Island Hibiscus. So I am happy to welcome this addition to the growing list of invertebrates sharing my garden that was once part of a dairy farm. For me, itchy cows are not an issue!

Photos – Densey Clyne

A survey of spider abundance and diversity comparing a seaside garden with a nearby rainforest remnant - Robert J. Whyte

Save our Waterways Now, www.sown.com.au

Introduction

In gardens, are locally native plants more biodiverse than exotic ones? Are natural areas more biodiverse than gardens and if so, to what extent?

To investigate these questions surveys of spiders were undertaken in a garden and the results compared with those from a nearby natural area. The spider data was a record of the number of spiders and their species, genera and families. The plant data consisted of values for plant diversity, plant origin and plant density.

It must be noted that these surveys were informal and not in any way ecologically or scientifically rigorous. They are of the type that could be conducted by an amateur



naturalist with moderate skills. While the observations and discussions have been mentored by professional collaborators, notably Dr Scott Carroll, Dr Robert Raven, Dr Ron Atkinson and many others, this mentoring occurred after the fact of the surveys themselves. A great many similar but more rigorous surveys would be required to draw firm conclusions. Therefore the inferences obtained here remain tentative.

Materials and methods

Brunswick Heads is a small, low-lying, holiday village at the mouth of the Brunswick River, NSW. A large estuary is protected by a constructed breakwater. To the south along the coastline to Byron Bay there is an open surf beach backed by dense coastal heath. Along the north bank of the river some remnant littoral rainforest patches are part of the fragmented Brunswick Heads Nature Reserve. To the west are Mt Chincogan, Mt Warning and the small town of Mullumbimby.

In the garden sample (located at Brunswick Heads, NSW (28.542973 S, 153.548275 E) there were mostly exotic plant species, in a ratio of about two-thirds exotic to one third native. It should be remembered that many gardens have a higher or lower proportion of native plants. These may or may not yield significantly different results and will be the subject of future investigations.

The area sampled was inside a fenced-off area along the front and right hand side of the property, included a dense stand of Sacred Bamboo (*Nandina domestica*), a Wheel-of-Fire Tree* (*Stenocarpus sinuatus*), a red-leaved Grandmother Plant (unidentified), a large Bangalow Palm, an Oleander-style vine with milky sap, a Gardenia, 2 Mandarin (*Citrus reticulata*), a woody *Abutilon* sp. (or similar Malvacea) with many resident harlequin bugs, a small Chilli Bush (*Capsicum* sp.), a Wedding Bush (not identified) and a Wisteria Vine. Native species are denoted thus*. This a fairly typical plant mix for a garden created in 1975-85 in this area of the world.

For comparison a bush area was chosen nearby in the hope of, as closely as possible, matching the conditions in the garden in terms of area, soil type, elevation, climate, geography and human use. This chosen area was somewhat degraded littoral rainforest in Pilgrim Park (28.547000 S, 153.546692 E). Similar fragments of the discontinuous Brunswick Heads Nature Reserve occur elsewhere in the region. The site featured medium plant density and diversity in the canopy, under-storey and ground level plant communities, though quite weedy at the latter two levels. The species included large paperbarks* (*Melaleuca* spp.), *Casuarina* sp.*, Brush and Swamp Box* (*Lophostemon* spp.), native ferns*, brackens* and reeds*, *Persoonia** spp, *Xanthorrea** spp., *Smilax australis**, *Parsonsia straminea**, an *Embelia*-like vine*, Easter Cassia, Small-leaved Privet, and Camphor Laurel. The site was the fringe of the reserve along the old Pacific Highway.

The sampled areas were rated into the following categories of density and diversity:



- 1 Very low diversity (monoculture)
- 2-3 Low diversity (2-4 plant types)
- 3-4 Medium diversity (5-8 plant types)
- 5 High Diversity (9 and above plant types)

- 1-2 Low density (sparse foliage)
- 3 Medium density
- 4-5 High density (thick foliage)

The foliage of shrubs, vines and small trees were lightly beaten by hand above a white plastic tray 60mm x 40mm x 15mm deep so that dislodged spiders and other invertebrates fell into the tray. The tray was then taken a short distance away and its contents examined with the aid of a hand lens. Swiftly moving animals were able to escape, adult insects by flight, others by foot, but these could be observed and recorded doing so. Spiders in each sample were identified to family, genera and species where possible either immediately, or put into specimen tubes for later identification and photography. Notes were taken of the number of spiders in total and the number of families, genera and species. Other invertebrates, e.g. ants, leaf hoppers, ladybird beetles, etc. were recorded by common name. The animals were released back to the environment upon identification. The sampling method yielded both diurnal and nocturnal species.

It should be noted that the sample method, by avoiding killing specimens, is somewhat deficient in terms of completeness and record keeping. To be sure of counting all specimens one would have to seal the container immediately and introduce some means of quickly immobilising the animals, e.g. Pyrethrum spray. It would be necessary to store the labeled specimens and the plant material and any other incidental debris if it were desirable to have the data verified by a third party. As the verification of the results and their possible meanings would be more valuably obtained by repeat experiments, the costs of recording and retaining the material in this way outweighed the benefits of killing the specimens.

Garden data

The first sample was a stretch of Sacred Bamboo (*Nandina domestica*) along the inside of the front fence line. Density medium-high, diversity very low (monoculture). The sample area was about 2m long by 1m deep. It yielded 6 spiders in three families, 3 *Moneta australis* (Theridiidae), 2 Salticid spiders (Salticidae) and 1 *Tmarus marmoreus* (Thomisidae). The Salticids and the Thomisids are day-hunting species (diurnal) and *Moneta australis* may well be day hunting as its web is only a few strands. However it has small, probably insufficient, eyes for diurnal activity.

The second sample was an intermingling of Sacred Bamboo (*Nandina domestica*), Indian Hawthorn (*Rapohiolepis indica*), Red-leaved Grandmother plant, Wheel-of-



Fire* tree (*Stenocarpus sinuatus*) and a nearby Elkhorn fern*. Density medium, diversity medium. The sample area was about 2m long by 1m deep, adjacent to sample one. It yielded 11 spiders in 5 families. The spiders identified included 4 of the common, nearly ubiquitous garden spider *Cheiracanthium gilvum* (Miturgidae), 3 *Sydmyella* sp. *S. lobata* type (Thomisidae), 2 *Moneta australis* (Theridiidae), 1 Jumping Spider (Salticidae) and 1 *Leucage granulata* (Araneidae). Also in the sample a few ants, 2 ladybird beetles and a flat, translucent Pentatomid bug. Compared with Sample 1, the increase in plant diversity of the sample area and the presence of a 7m native tree can be assumed to have influenced the animal diversity and abundance.



Moneta australis (Theridiidae) Australian Money Spider. Body length 3.5mm



Sydmyella sp., (Thomisidae). Body length about 4mm.

The third sample was a high shrub, a "Wedding Bush" with small, pale yellow leaves (unidentified) in the right-hand corner of the garden, a mature Bangalow Palm above and waste pile of dry plant debris below. Only the Wedding Bush was sampled (not flowering but notable for profuse flowers in season). Diversity very low (monoculture), density low. The sample yielded 3 spiders in 3 families; an *Oxyopes* sp. (variabilis type), a *Cheiracanthium gilvum* (Miturgidae) and a *Thomisus spectabilis* (White Crab Spider). Free ranging and agile *Oxyopes* spp. tend to live on the fringes of flowering plants capturing insects attracted by the blooms, as does the White Crab Spider, the latter relying on camouflage more than agility. These spiders may stay on plants with diminished returns in non-flowering periods, rather than travelling to other plants, especially in garden situations where plants are often isolated rather than in communities. The small numbers and low diversity of animals in this sample seems to correlate with the low plant diversity and density.

The fourth sample area was a mixture of plants and vines, being another Red Grandmother Bush, an oleander-like vine with milky sap, and another nondescript shrub (unidentified). The presence of the vine increased density (medium) more than diversity (low), as it was intertwined through the other two plants. The sample



yielded a comparatively high number of animals across many invertebrate groups, including 2 small green Mantids, many ants of 2 or 3 kinds, a weevil, 3 snails, a silverfish and as for spiders, 6 in 4 families, being 3 *Cheiracanthium gilvum* (Miturgidae), an *Argyrodes* sp. (Theridiidae), a *Sidymella* sp. (Thomisidae) and 1 *Oxyopes* sp. (variabilis type) (Oxyopidae).



Tmarus marmoreus (Thomisidae).
Body length 4mm.



Opisthoncus parcedentatus, Salticidae, or a related species. Body length 9mm.

The fifth sample was a single Mandarin tree, about 3m tall by 2m wide at its centre. This sample yielded a Yellow Shouldered Ladybird Beetle, many ants (more than 10) all apparently of one type (perhaps tending scale insects), a Steel Blue Ladybird Beetle (*Halmus* sp.) and 2 spiders, both *Opisthoncus* spp. (Salticidae), a juvenile and an adult. In terms of spiders this sample yielded the lowest spider diversity. Plant diversity very low (monoculture) density medium. The results of this sample were surprisingly low in numbers and especially diversity of spiders. This may have been collateral damage from pest control. Another Mandarin tree was sampled for comparison.

Sample six was a single Lilly Pilly (*Syzygium australe**) somewhat more dense but not as tall or wide as the Mandarin. Diversity very low (monoculture) density medium. The sample yielded 8 spiders in 4 families being a mature *Opisthoncus* sp. (Salticidae), 4 *Cheiracanthium gilvum* (Miturgidae), an *Argiope* sp. (Araneidae), and 2 small Theridiid spiders (Theridiidae).

Sample 7 was Mandarin 2, smaller than Mandarin 1, but similar. This sample yielded 3 spiders in 2 families being 2 *Cheiracanthium gilvum* (Miturgidae) and a *Theridion pyramidale* (Theridiidae). There were also 2 ladybird beetles, one of them being a Mealybug killer. Density medium, diversity very low (monoculture).



Sample 8 was *Syzygium australe** 2, smaller than the Lilly Pilly in sample 6, yielded 7 spiders in 4 families, being a *Thomisus spectabilis* (Thomisidae), a mature *Opisthoncus* sp. (Salticidae), 3 *Cheiracanthium gilvum* (Miturgidae), and 2 Theridiid spiders (Theridiidae). The comparison in abundance of spiders in the Mandarin trees vs the Lilly Pillies showed much greater abundance and diversity in the Australian native species, all other variables being very similar.

Rainforest remnant data

Sample 9 along the edge of a fragment of remnant littoral rainforest as described above yielded 25 spiders in 8 families being 2 orb weavers, 1 *Araneus* type and 1 *Arkys cornutus* (Araneidae), 9 very small Theridiid spiders, 1 juvenile *Thwaitesia* sp., 1 *Argyrodes/Conopistha* sp. (Theridiidae), 1 Tetragnathid sp. (Tetragnathidae), 2 unidentified Jumping Spiders (Salticidae), 1 *Cymbacha* sp., 2 *Sidymella* sp. (Thomisidae), 1 *Badumna longinqua* (Desidae), 3 *Oxyopes* sp. (Oxyopidae) and 2 Uloborid spiders (Uloboridae).

Detailed summary of findings

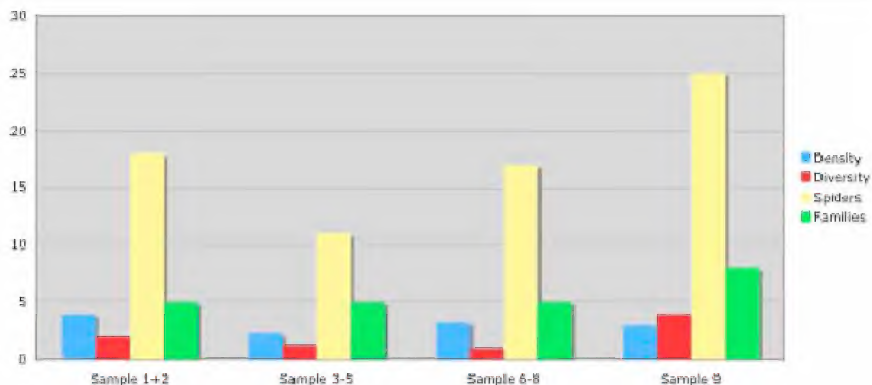
As the garden samples were smaller, sometimes a single plant, they were aggregated to give areas equivalent to Sample 9 (the rainforest remnant). The rainforest fringe, though a degraded habitat, yielded the most spiders (abundance) and the greatest number of families (diversity) when compared to the aggregated garden samples. Sample 9 also had the highest plant diversity, suggesting higher plant diversity tends to result in higher faunal diversity. It was equal second highest in plant density. In the garden, plant origins (native vs exotic) were found to play a larger role than plant diversity or plant density. The greatest amount of diversity and abundance in the garden occurred where greater plant diversity and native species combined (Sample 2). The next most diverse and abundant sample was Sample 6, a single native Lilly Pilly. Sample area 4, with medium plant density and diversity of exotic plants produced 15 spiders in 4 families, however Sample 8, a single small Lilly Pilly also produced 15 spiders in 4 families with roughly similar plant density but much lower plant diversity (a single plant). Comparing the two Lilly Pillies showed that the slightly denser foliage of Sample 6 produced more spiders than Sample 8, otherwise they tested almost identically.



One of the insects collected in the survey.

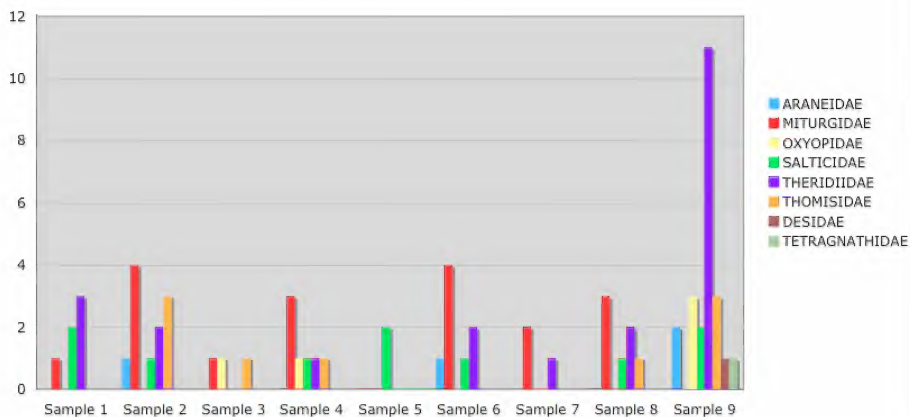
The lowest spider diversity was produced by Sample 5, a single Mandarin tree, despite medium density. The next lowest spider diversity was produced by a second single Mandarin tree (Sample 7).





Comparing Sample 9 with similar sized samples by aggregation. Data: Plant density, plant diversity, number of spiders, number of spider families. (8 garden samples aggregated into 3)

Theridiidae was the most common spider family in the natural area, while Miturgidae was the most common family in the garden samples. This family was represented by one spider, *Cheiracanthium gilvum*, absent from the samples in the bush. *C. gilvum*, previously in Clubionidae, is a roving species that nevertheless has silken retreats. This suggests, because it is likely they were residents not blow-ins, that the garden habitat may be comparatively favourable for this spider, allowing it to produce greater numbers. It may also reduce the number of other spiders by eating them, or be better at avoiding being eaten by other predators. It was interesting also to note that for other invertebrates, ladybird beetles were common in the garden but not the bush.



Relative abundance (numbers of spiders) by family and sample:



Discussion

Urbanisation is possibly the main cause of habitat loss and degradation and it is often the most biodiverse habitats that are lost, as these have attractive features for human habitation.

From this study we can see some signs of spider diversity being not only greater in natural areas, but also greater in native plants than exotics in gardens. Assuming that spiders are a reliable indicator for biodiversity (Downie et al 1998, Clough et al 2005, Borges & Wunderlich 2008, and references therein) this corresponds to the widely-held belief that natural plants and habitats are more biodiverse than managed agricultural or garden habitats. The obvious inference is that we can improve biodiversity by planting locally-native species in gardens.

However there are many variables in surveys like these and while one can draw some tentative conclusions it would need to be repeated many times in many locations. Future surveys may produce data to substantiate one practice or another in the pursuit of biodiversity.

This brings up the question of what we hope to achieve with gardens, why we hope to achieve it, and how we can go about creating the conditions we desire.

Conclusions

If the objective of sustainable urban design is to limit or slow the rate of habitat loss and the consequent loss of biota and its diversity, knowing the impacts on biodiversity of different types of vegetation will be useful. It seems that while plant density and plant diversity are factors affecting faunal diversity, these are not as important as the differences between native vs exotic plant species.

Density and complexity, moreover, may not be desired or realistically achievable in a garden. The intention of gardens is not traditionally to be extremely dense and complex, as they are human recreation spaces as well as habitats. As an example, any natural area is likely to have significant diversity at the ground and canopy level, something traditional gardens do not aspire to, as they require open space for free movement. However, while retaining their garden function, they can be locally native without sacrificing amenity.

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Life History Notes on the Banded Grass-skipper, *Toxidia parvulus* (Plotz, 1884) Lepidoptera: HesperIIDae - Wesley Jenkinson

This hesperiid is one of many small species located throughout the eastern Australian states. Even though the species is quite common locally, any published detail regarding the life history appears to be lacking.

In South East Queensland the species is generally more restricted in its habitat range than the common Dingy Grass-skipper (*Toxidia peron*) and usually avoids suburban gardens (unless suitable habitat exists nearby). It is locally common in the foothills and mountain slopes of the Great Divide, where it is chiefly established in a range of moist and dry eucalypt open forests where suitable host grasses are growing.

The adults are slower and less robust in flight than *T. peron*, and usually remain closer to the ground than other species in the genus, unless searching for flowers. Both sexes are readily attracted to a wide variety of small native and introduced flowers. The average wingspan for the males is 23mm and 24mm for the females.



Banded Grass-skipper (*Toxidia parvulus*)



Ovipositing was observed during warm, sunny conditions around midday, during March 2008 in South East Queensland. Females fluttered slowly amongst the host grasses and settled on the stems, laying eggs singly on sheltered parts of the stem. They appeared to have a preference for the softer grass established in semi-shaded areas below large eucalypt trees. After an egg was laid, they flew several metres in search of another suitable location to lay the next egg. While ovipositing, the wings remain closed and the abdomen was curled onto the host plant.

I could not identify the host grass the eggs were collected from. The species is known to use *Poa* spp. listed by Moss, 2005. The larvae were successfully raised on an exotic species, Prairie Grass (*Bromus catharticus*) a host grass used by *T. peron* in my area. It is doubtful whether *T. parvulus* would use this grass as a natural host.



Previously, I had collected several eggs during December 2006 and raised them in captivity at Beaudesert in South East Queensland. They were dome shaped, approximately 1mm wide by 1mm high with 13 or 14 coarse vertical ribs. Colour was initially pale green when laid, changing to pale cream after one day, with pinkish-red markings forming a horizontal band and apical spot three days later.



Pictured 2nd instar larva of *T. peron* with typical shelter and feeding pattern similar to *T. parvulus*.

Soon after emergence first instar larvae consumed the eggshells and then commenced building their shelters. During a brief observation at 9.45am, a larva was seen outside the shelter stitching silk threads across its side margin. The first shelter was approximately 10mm in length and near the apex of a grass leaf. The early instars created a fold and stitched the leaf edges together along the leaf outer

margin. Their shelters were later lined with silk. This is a similar style of shelter to that created by the early instars of *T. peron* - (as pictured). In captivity, the later instars stitched several leaves together in a parallel formation to create the larger shelters. Feeding occurred normally around dusk when larvae consumed sections of leaf from its outer edge near the shelter.

All larvae completed five instars and reached an average size of 20mm.



1st and 3rd instar larvae.





5th instar
larva



Pupa with 5th instar head capsule

In captivity the pupae were located in the final silk lined shelter created on the base of the container and were attached by the cremaster. The white waxy powder covering the pupal surface found in many hesperiid genera was absent. The pupae averaged 15mm in length.



All eggs laid on 3rd December hatched in 8 days but larval duration varied from 65 to 74 days. Pupal duration was 10 days in all cases, with adults emerging (in late February to early March) from 83 to 92 days since oviposition.

There are probably two or possibly three generations in southeast Queensland. Within the new Scenic Rim Regional Shire I have recorded adults from September until April.

References:

- Braby, M.F., 2000. Butterflies of Australia – Their Identification, Biology and Distribution. vol 1. CSIRO Publishing.
- Moss J.T. 2005 Butterfly Host Plants of south-east Queensland and northern New South Wales. 2nd rev. edition, BOIC.

Photos Wesley Jenkinson

Life History Notes on the Moth *Coequosa triangularis* (Donovan) -- Glen Cleminson

I found a very large larva on my Macadamia nut tree in my garden at Ningi, just north of Brisbane on Tuesday, 28th October 2008. It was yellow in colour, 12cm long and 3.5cm wide.





Coequosa triangularis adult

I took the larva and raised it up. It went into pupa on Saturday, 29th November 2008. The adult emerged on Thursday, 22 January 2009. It turned out to be the very large moth called *Coequosa triangularis*.

Coequosa triangularis is a member of the Sphingidae family, subfamily Sphinginae. It ranges from the coast and tablelands of southern Queensland to southern coastal New South Wales (Common, 1990).

Larval food plants belong to the Proteaceae and include *Persoonia*, *Banksia*, *Grevillea robusta*, *Macadamia integrifolia* and *Stenocarpus sinuatus*.



Coequosa triangularis larva (left) and pupa (right)

Reference:

Common, I.F.R. (1990) Moths of Australia. Pub. Melbourne University Press.

Photos Glen Cleminson

Editor's note: See Issue 49, June 2008 for Peter Hendry's article on the related moth *Coequosa australasiae*.

Observations on Butterfly Host Plants - Bill Graham

I live in Malanda, a small town on the Atherton Tableland in Queensland. I observed a species of *Eurema* ovipositing amongst plantation grass on a suburban street. I thought it might be *E. alitha* and upon investigation found several eggs and larvae on a species of "bindi-eye". I'm not sure of the scientific name of this plant, but it is a *Trifolium* look-alike with yellow flowers and a flattened round burr containing four seeds. Perhaps another member can



"Bindi-eye" showing burrs





Eurema hecabe feeding on "bindi-eye"

identify the plant from the photos and description. I then observed several *Eurema* ovipositing amongst grass on the Malanda Showground. Investigation revealed many eggs and larvae on common white clover. I captured several adults and identified the species to be *E. hecabe*. I also raised larvae on both clover and "bindi-eye" to confirm this

identification. *Eurema* host plants on the Atherton Tableland include *Senna* spp. and *Breynia* spp. but searching many of these plants revealed no eggs, larvae or feeding. It seems amazing that this observation hasn't already been noted given the abundance of both plant and butterfly species.

I have many butterfly host plants on my property including *Asclepias* spp. There are numerous *Danaus plexippus* (Wanderer) breeding on these plants and I find larvae will wander once a plant has been defoliated. Many of these larvae have been found



Danaus plexippus feeding on *Marsdenia*

feeding and completing their development on *Marsdenia* spp., a common rainforest vine often used by *Euploea core corinna* on the Tableland and growing commonly on my property. I have never found *Danaus* eggs on *Marsdenia* but once a larva finds this plant it appears content to remain.

Pantoporia consimilis (Orange Plane) is relatively common on the Atherton Tableland. Michael F. Braby reported larvae will accept *Senna retusa* in captivity. I have both *S. retusa* and *S. auriculata* growing on my property and both species are extensively used by *P. consimilis* under natural conditions.

References:

Braby, Michael F. 2000 Butterflies of Australia: Their Identification, Biology and Distribution. CSIRO Publishing.

Photos by Bill Graham



Response to “Observations on Butterfly Host Plants” – John Moss

The “*Trifolium* (clover) look-a-like” is an exotic *Medicago* species which includes Lucerne (*M. sativa*) and Black Medic (*M. lupulina*). There are records of Common Grass Blues utilizing these plants but *Medicago* (one of the soft burrs) is a first record for *Eurema hecabe*. All *Medicagos* have yellow flowers except Lucerne which of course has mauve and occasionally white flowers. I suspect the species in the photo is *M. laciniata* or “Cut-leaf Medic” as the photo shows characteristic stipules with long “teeth”.

Eurema hecabe is polyphageous, with many hostplants among the legume families. *E. alitha* is far more specific utilizing, as far as is known, only one species in one genus (*Glycine*) of the Fabaceae family (see 2 articles in our December 2008 issue, No. 51).

I have also found *E. hecabe* ovipositing on the exotic white-flowering clover (*Trifolium repens*) here in the Redlands, but most larvae died in early instars. Only one larva went through to pupate but it took far longer than if it had used a regular hostplant (up to 5 weeks). The resultant adult was stunted.

The “wandering” Wanderer larvae mentioned are lucky there is an alternative hostplant for them to complete development on. It is not indicated whether or not they reach full size. It’s probably just as well this successful self-introduction normally sticks to its exotic asclepiad hosts, rather than our native flora which could be threatened.

I feel sure Michael Braby (also a member) will note the comments on *Pantoporia consimilis*! *Senna retusa*, by the way, is now *S. gaudichaudii*, another confusing name change!!

The first record of the noctuid *Tiracola plagiata* feeding on *Pararistolochia praevenosa* - Hilton Selvey

I have always thought that the toxins in the leaves of *Pararistolochia praevenosa*, were toxic to all larvae with the exception of *Ornithoptera richmondia*. A recent discovery revealed that such is not the case.

On the 23rd. September 2008, while examining some of the vines on our property, a whole section of vine was found with the leaves eaten and in some cases skeletonised. The culprits were easily found. They were moth larvae 10 mm in length. There were dozens of



Early instar larva of *T. plagiata*



larvae, three of which were brought inside to raise through. The rest were destroyed. There were so many that it took a week to make sure that none remained.



Eating pattern of *T. plagiata*

The eating pattern of the larvae is quite different from that of the Birdwing larvae, which generally eat across the width of a leaf. The moth larvae eat holes in the leaves as shown in the photograph. Green grasshoppers shredded the leaves but I have never discovered whether they died as a result.

The larvae grew very rapidly and by the 9th October they were 45mm in length. By the 12th they had formed a cocoon below the paper on the bottom of their individual containers. By the 16th the

pupae were fully formed and were removed from their cocoons to be observed. The three appeared identical and were 30mm in length. They were similar in appearance to other moth pupae, which I have found in soil although they were larger, and had four spines at the end of their abdomens, whereas other pupae that I have seen had only one. I hypothesize that these spines help the pupae

wriggle their way out of the soil. (Ed. note: Ted Edwards indicated that it is very unlikely pupae move up the soil but the adult moth scrambles up.)

On the 6th November, 45 days after the larvae were discovered the moths emerged and were photographed. All the data I had was sent to Mr. E.D. Edwards who replied as follows:

"The moth is *Tiracola plagiata* in the family Noctuidae. The larvae feed on 26 families of plants. Amongst these there is no mention of Aristolochiaceae, but other families noted for

their poisonous principles are included. In Australia it is known as the banana fruit caterpillar reflecting one of its favoured food plants."

I have again been in touch with Mr. Edwards who said that the specific name of *plagiata* probably refers to the pattern of the forewing.



Discussion –

The time it took for the larvae, when discovered, to turn into moths was 45 days. Add say, 10 days for the time from egg to 10mm larvae. The worst case scenario would be that in a few months there would be thousands of larvae, but according to Mr. Edwards, the moth presumably has a full range of predators and parasites which normally keep numbers in check.



Pinned adult specimen of *T. plagiata*

One wonders if the larvae of *Tiracola plagiata*, with their seemingly rapacious appetite, might possibly devour any eggs or small larvae of the Richmond Birdwing they may find on the leaves of *Pararistolochia praevenosa*.

Acknowledgements:

E.D. Edwards identified the moth and made a valuable comment on the derivation of the moth's name. J. Moss for helpful comments on an earlier draft and Murdoch De Baar for those in the final article. My wife Enid extracted the photographs from my camera and used her computer skills in their preparation for this document.

Photos Hilton Selvey

AT THE LIGHT TRAP

At the Light Trap: Records of daytime flying moths (Lepidoptera: Noctuidae: Agaristinae) and the genus *Donuca* (Lepidoptera: Noctuidae: Catocalinae) – Peter Hendry

The Noctuidae subfamily Agaristinae contains 45 named Australian species. Common (1990) states that one or two species freely come to light and others do occasionally. He notes *Ipanica cornigera* (Butler, 1886) as mainly nocturnal and freely comes to light. He also notes that the whistling moths in the genus *Hecatesia* (Boisduval 1828) have females that sometimes come to light.

I have had two other species come to light. On the 20/10/2008 some 27k N.W. of Ingham, *Mimeusemia centralis* (Rothschild, 1896) and *Argyrolepidia aequalis* (Walker, 1864) made an appearance. *M. centralis* also came to light on the night of the 22/10/2008, 18k S.E. of Millaa Millaa. On the night of the 25/10/2008 *A. aequalis* came to light, some 77k N.W. of Mackay. It also made an appearance on the night of the 5/11/2007 at Bellthorpe.



The genus *Donuca* (Walker 1865) belongs to the subfamily Catocalinae of the Noctuidae. Up until I started writing this article, I believed I had collected all the six named species. What I thought was a specimen of *D. xanthopyga* (Turner, 1909) I now believe to be a variation of *D. castalia* (Fabricius, 1775) {wingspan c. 40-60mm}.

My initial assessment was based on images by Buck Richardson, in his book “Mothology: Discover The Magic” and on his web site, but reading a description on Don Herbison-Evans web site, Don clearly states that the last four segments of the abdomen are yellow. My image of what I will refer to as *D. castalia* “white banded form” does not show the tip of the abdomen, but is clearly seen in the close up of the pinned specimen. This close up of the “white banded form” reveals there is no yellow tip and the sides of the abdomen are red, as in all specimens of *D. castalia* in my collection. If I am right in this assessment, I have doubts about the identity of the moth in Buck Richardson’s work, as the tip of the abdomen is concealed in his images. From a comparison of the images of my *D. castalia* “white banded form” and Buck’s *D. xanthopyga* based on wing patterns alone, one cannot conclude that these are different species.



Mimeusemia centralis



Argyrolepidia aequalis



Donuca castalia



Donuca castalia white banded form



Donuca castalia grey banded form

The “white banded form” of *D. castalia* was collected from my bush block west of Bundaberg on the 27/10/2009. A “grey banded form” had previously been collected from this site, on the 21/03/2008. These are extremes of colour variation -- all the others I have seen or collected from this site, though varying



slightly, have been more uniform in colour. *D. castalia* has been a frequent visitor to my home at Sheldon, Redland City and all of these conform to the more uniform pattern. *D. castalia* is by far the *Donuca* I see the most. As far as I know, nothing has been published on its biology.



Abdomen of *Donuca castalia*



Abdomen of *Donuca castalia* white banded form

D. orbigera (Guenée, 1852) {wingspan c. 50mm} has come to light on several occasions both at home and on my bush block. I have also recorded it at Bellthorpe, 5/11/2007, and at Cania, central Queensland 28/10/2009. Common (1990) gives its distribution as the Northern Territory, Queensland and northern New South Wales.



Donuca orbigera



Donuca rubropicta

D. rubropicta (Butler, 1874) {wingspan c. 60-65mm} is also a frequent visitor to my bush block and here at Sheldon. It also made an appearance on the night of the 5/11/2007 at Bellthorpe. *D. rubropicta* distribution is restricted to eastern Queensland and north-eastern New South Wales, (Common 1990).

D. lanipes (Butler, 1877) {wingspan c. 65mm} is an infrequent visitor to my bush block. While I have seen it on three occasions I only have one recorded date 7/11/2007. On a recent trip around central Queensland and northern New South Wales it came to light about 70k west of St George on the night of the 2/11/2009. Common (1990) gives its distribution as the Northern Territory, Queensland and northern New South Wales.





Donuca lanipes



Donuca spectabilis

D. spectabilis Walker, 1865 {wingspan c. 50-55mm} is widely distributed in Western Australia, where its larvae feed on *Acacia saligna* Common (1990). It also occurs in inland Queensland, New South Wales, central Australia and South Australia (Common 1990). I have encountered *D. spectabilis* at Cania central Queensland 28/10/2009 and near the Thompson River just north of Longreach 31/10/2009.

Note: Common (1990) puts the number of Donucas as seven but only names and deals with four. Don Herbison-Evans lists seven on his web site, with the seventh being *Donuca memorabilis*, Walker 1865. However Neilsen, Edwards and Rangsi (1996) list only six and note *D. memorabilis* as a new synonym of *D. spectabilis*.

References:

Common, I.F.B. 1990. *Moths of Australia*. Melbourne University Press

Don Herbison-Evans web site

<http://linus.socs.uts.edu.au/~don/larvae/cato/catocalinae.html>

Neilson, E.S., Edwards, E.D. and Rangsi, T.V. 1996 Checklist of Lepidoptera of Australia. CSIRO Publishing

Buck Richardson's web site

http://www.leapfrogoz.com.au/LeapFrogOz/Moth_Identification_4.html

Richardson, B. 2008. *Mothology: Discover the Magic*. Leapfrogoz, Kuranda

Photos Peter Hendry

Have you seen this moth? – Peter Hendry

Dr. Markus Riegler is conducting research on *Pholodes sinistraria*, a member of the moth family Geometridae subfamily Ennominae. He is after eggs or larvae from Southern Queensland or Northern New South Wales populations to compare with populations from the Sydney region. Eggs are readily obtained by keeping the moth in a small container. Eggs are light green and don't hatch for 7-10 days - so ideal for transport. First instar larvae are very characteristic, being black with white stripes.

P. sinistraria is known to feed on *Eucalypt*, *Angophora*, *Acacia*, and *Exocarpus*.





Pholodes sinistraria female



Pholodes sinistraria larvae

If you are able to help please contact Markus, email: m.riegler@uws.edu.au

Photos Markus Riegler

CD REVIEW



NORTHERN TERRITORY INSECTS, A COMPREHENSIVE GUIDE. AN INTERACTIVE DIAGNOSTIC TOOL FOR THE IDENTIFICATION OF THE INSECTS OF THE NORTHERN TERRITORY by Graham Brown: reviewed by Murdoch De Baar

This CD on Northern Territory Insects (NTI) gives: keys and family (sometimes subfamily) separating characters for insects and other invertebrates; lists of species present in the Northern Territory; common names lists; photographic

examples for each of the families; and many references. A lot of valuable family characters are included. Some 8,000 species are listed.

Within the invertebrates, photographic examples and family characters are presented for the non-insects such as the spiders, mites and ticks, centipedes, millipedes, snails, slaters and, very briefly, the worms.

The NTI photographs are very crisp. When NTI is opened, the reader is confronted with the choices: identifications; economic species; conspicuous species; biology; geography; morphology; collecting; glossary etc., and a search engine which can be useful. Under “economic species” for example, one is directed to: household pests; backyard pests; plant pests; quarantine pests. There is an impressive collection of



quarantine pests illustrated as photographs. The Author has indicated that there are 4,000 to 5,000 photographs and I have not counted them.

There are a few mistakes that have sneaked in, but overall it is a very accurate work. When 'Pieridae' is opened, the reader is directed to the 'Pylalidae'. The second *Liphyra brassolis* (Lycaenidae) is in fact a *Zizula hylax*. I feel more species could have been illustrated in such important groups as the native cerambycids and buprestids and few native scarabs (Scarabaeoidea) are identified to species. Also a number of unidentified species are illustrated, for which I would have preferred to see an identified species. I can understand that the Northern Territory butterflies are already identifiable via other available publications. But having said the above, there are photographic examples for all the families, so useful for, as an example, the small Hymenoptera and Hemiptera. Within the various groups, immature examples (i.e. moth larvae) are illustrated and 'searching the termites' will give the reader a good cross section of termites and their mounds.

My first impression of NTI was that it seemed to be a little unfriendly to find species, but once you navigated the CD, it was easier. The Author has crammed a lot of headings to follow and this would not have been easy for Graham Brown to compile.

This is a valuable work for the student of invertebrates and anyone interested in entomology. During his working life the Author has had a good all-round grounding in Australian invertebrates and has obviously put in a **huge** amount of work in compiling this interactive CD.

I would recommend this CD as a valuable invertebrate reference. #

Ed. Note : The CD is available from the CBIT online shop <http://shop.cbit.uq.edu.au/ProductDetails.aspx?productID=228> at a cost of \$76.95 + postage/handling, which varies.

WHAT INSECT IS THIS?

Mystery Photographs – Ross Kendall

The first shot was taken at Easter near our favourite camping spot on Upper Thane Creek west of Warwick, Qld. The "turret" of mud balls and small pebbles was about 30 mm high and 25 mm in diameter and was constructed over a hole on a flat area of ground. This circular hole was about 5 mm in diameter.

I have no ready answer to this puzzle, just a few suggestions. It would appear that the creature built the turret so that surface runoff from recent rains did not flood its



underground chambers or tunnels. Mud balls would suggest a wasp, spider or ant of some kind.



What is it?

The second shot was taken in late September on the edge of a clay pan at Bladensburg National Park southwest of Winton, Qld. Careful probing with a twig established that the vertical hole was about 20 cm deep. It had a diameter of approximately 12 mm and what appears to be a discarded trapdoor lay on the grass.

The area experienced good rains earlier this year and clays would have remained wet and malleable for many weeks. What creature built this?



Photos
Ross Kendall

.... and this?



PHOTO GALLERY

Images of Arctiidae moths in the subfamily Lithosiinae



Lyclene quadrilneata (Pagenstecher, Aug. 1886)



Oenistis altica (Linneaus, 1768)



Termessa conographa (Meyrick, 1886)



Termessa conographa (Meyrick, 1886) variation



Termessa nivosa (Walker, 1865)



Tigrioides alterna (Walker, 1854)

Photos Peter Hendry



Images of Butterfly Larvae

Nymphalidae



Varied Eggfly (*Hypolimnas bolina*)



Leafwing (*Doleschallia bisaltide*)

Pieridae



Lemon Migrant (*Catopsilia pomona*)



Common Migrant (*Catopsilia pyranthe*)

Papilionidae



Ambrax Swallowtail (*Papilio ambrax*)



Dainty Swallowtail (*Papilio anactus*)



Clearwing Swallowtail (*Cressida cressida*)



Chequered Swallowtail (*Papilio demoleus*)

Photos Ross Kendall



OTHER GROUPS' ACTIVITIES

DODD COLLECTION ON DISPLAY AT QUEENSLAND MUSEUM SOUTH BANK

Opening 13th February at Queensland Museum South Bank is the spectacular and historic **F.P. & A.P. Dodd Collection of Tropical Insects from Australia and New Guinea**. This display will consist of 28 cases of beautifully arranged show cases dating from 1917 through to the 1960s.

The display will continue for approximately six months at South Bank.

On 5th March at 12.30pm in Queensland Museum South Bank Theatre, Geoff Monteith, former insect curator at Queensland Museum and author of the award-winning book "The Butterfly Man of Kuranda – Frederick Parkhurst Dodd" will give his lecture "The Butterfly Man of Kuranda - The Life and Times of an Early Australian Naturalist". Queensland Museum is currently preparing a smaller-format edition of this book as well as a souvenir guide and other associated insect publications.

As a 21-year-old bank clerk, Frederick Parkhurst Dodd was reluctantly transferred from Victoria to the remote Queensland frontier town of Townsville in 1884. A fascination with the wonderful tropical insects of the region led him to quit the bank in 1895 to devote his life to their study. Settling later in Kuranda, he developed a spectacular show collection of insects for public viewing. When he toured it around Australia in 1918 and 1923 he became a national figure as "The Butterfly Man of Kuranda". His son, Alan Dodd, brought the *Cactoblastis* moth from South America to rid Australia of the scourge of prickly pear, an outstanding achievement rewarded by both MBE and OBE. Towards the end of his busy career and in his retirement Alan undertook several adventurous collecting trips to New Guinea. With the fruit of these trips he produced beautifully arranged cases that complement the older collection of his father.

In 1987 Dodd's daughters, Elizabeth and Katherine, donated the remaining 42 cases in near-perfect condition to the Queensland Museum. The collection toured all over Queensland and New Zealand before it was rested. A generous injection of funds from Queensland Office of Gaming Regulation matching funds raised by the Queensland Museum Foundation has made this completely redesigned display possible.

In the future Queensland Museum also hopes to display the collection at Cobb & Co. Museum, Toowoomba and Museum of Tropical Queensland, Townsville.





The featured species in this case is the Ulysses Butterfly (*Papilio ulysses*) which occurs in New Guinea and North Queensland.



“The Grand Parade”. F.P. Dodd arranged this case of 1350 showy North Queensland beetles for his tour of the southern states in 1918. Photos Queensland Museum



BOIC ON FACEBOOK

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Type <http://www.facebook.com/group.php?v=wall&gid=187619097411> into your browser. View details of upcoming excursions, read posts on invertebrate discussions, share invertebrate information, and more!

BUTTERFLY AND OTHER INVERTEBRATES CLUB PROGRAMME

Overnight excursion to the "Peace Garden and Little Bird Haven" property, Coominya

- What:** Overnight excursion to Ray and Delphine Archer's "Peace Garden and Little Bird Haven" property, Coominya. In 3 years Ray and Delphine have transformed their property into a wildlife haven. It attracts many butterflies and other insects, as well as many bird species and frogs. We will camp there overnight, or feel free to visit for a day trip on either the Saturday or Sunday. There are walking tracks on the property, an aviary, and a billabong. Insect light trapping will be held at night.
- When:** **Saturday 6th - Sunday 7th February 2010**, though day-trips are also possible. We aim to arrive at the property from 2pm on Saturday.
- Where:** Gatton-Esk Road, Coominya (west of Brisbane). RSVP for address.
- Bring:** Camping gear (tent, sleeping bag, sleeping mat) if staying overnight, all meals, insect repellent, hat, water, sunscreen, togs and towel.
- RSVP:** Alisha Steward a.steward@griffith.edu.au or 0402 091 863 or 3275 1186. Phone Ray for directions - 0409 491 419.

Ed. If you plan to attend please either email or phone me for a map showing the directions to the property. daphne.bowden1@bigpond.com ph. 07 3396 6334.

Planning and Management Meeting

- What:** Our planning meetings are informative and interesting. As well as planning our activities we share lots of information. All members are welcome as this activity is also a general meeting of members.
- When:** **Saturday, 13th February, 2010 from 1.30 pm**
- Where:** Rob MacSloy's home (directions supplied on R.S.V.P.)
- R.S.V.P.** Rob on 07 3824 4348 or Daphne on 07 3396 6334
-



DISCLAIMER

The magazine seeks to be as scientifically accurate as possible but the views, opinions and observations expressed are those of the authors. The magazine is a platform for people to express their views and observations. These are not necessarily those of the BOIC. If inaccuracies have inadvertently occurred and are brought to our attention we will seek to correct them in future editions. The Editor reserves the right to refuse to print any matter which is unsuitable, inappropriate or objectionable and to make nomenclature changes as appropriate.

ACKNOWLEDGMENTS

Producing this magazine is done with the efforts of:

- Those members who have sent in letters and articles
- Lois Hughes who provides illustrations including the cover
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- Printing of this publication is proudly supported by Brisbane City Council



We would like to thank all these people for their contribution.

Dedicated to a better Brisbane

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Butterfly and Other Invertebrates Club Inc.
PO Box 2113
RUNCORN Q. 4113

Next event – Overnight excursion to the "Peace Garden and Little Bird Haven" property, Coominya – 6th to 7th February, 2010



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